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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,858	03/24/2004	Michael B. Korzenski	020732-110.694	5492
24239	7590	05/02/2007		
MOORE & VAN ALLEN PLLC P.O. BOX 13706 Research Triangle Park, NC 27709			EXAMINER AHMED, SHAMIM	
			ART UNIT 1765	PAPER NUMBER
			MAIL DATE 05/02/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/807,858

Applicant(s)

KORZENSKI ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/26/07 has been entered.

Response to Arguments

2. Applicant's arguments filed 2/26/07 have been fully considered but they are not persuasive. As to 1112, first paragraph rejection, applicant's showing of the paragraphs 0016,0030 and 0042-0045, do not inherently provide the supporting of the presence of the at least one implanted ion prior to contacting or soaking the ion implanted photoresist layer. Examiner also pointed that no wherein the specification discloses that the removal composition having the implanted ion prior to soaking or contacting the composition with the material (photoresist) to be removed.

As to Sehgal, applicants argue that examiner fails to provide a motivation why some one will select a temperature between 50 to 90 degree C over the teaching of Sehgal's temperature range of 31 degree C to 110 degree C.

Applicants also pointed out that obvious to try any of the temperatures above the critical temperature is not standard for establishing obviousness.

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In response, examiner states that Sehgal teaches the temperature of the supercritical fluid will be much higher than critical temperature of 31 degree C (paragraph 0010) and in a preferred embodiment the temperature can be 110 degree C (see at least paragraphs 0075-0076).

Sehgal also teach the higher temperature (about 80 degree) and pressure will accelerate the stripping of photoresist using the supercritical fluid (paragraph 0058) and one skilled in the art would have been motivated to do so for accelerating the stripping rate.

In conclusion, examiner states that Sehagal's removal temperature range (31-110 degree) is overlapping the claimed range of 50-90 degree C and it has been held that where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191USPQ 90 (CCPA 1976); see also MPEP 2144.05 [R-5].

As to the provisional double patenting rejection, applicant's argument is persuasive to overcome the rejection and accordingly the double patenting rejection is withdrawn.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 36 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which

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was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specification sections of paragraphs [0016] and [0030] as applicants mention in the previous response do not provide support for the limitation of "the removal composition comprising at least **one implanted ion**". In the above sections, specification just discloses removal of the ion implanted photoresist using the SCF based composition but nowhere in the specification discloses that the composition comprises at least one implanted ion.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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7. Claims 15-23,25-27,30,35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1).

Sehgal teaches a process for removing photoresist or BARC using a composition in which the composition comprises supercritical fluid (SCF) of carbon dioxide, co solvent such as isopropanol (paragraphs 0017,0028-0029 and 0069) and hydrogen peroxide (paragraph 0043).

Sehgal teaches that the composition may include ammonium fluoride (paragraph 0048), wherein the oxidizer or the ammonium fluoride may work as the claimed etchant.

Sehgal teaches the composition may include surfactant, which may be anionic, cationic or non-ionic (see paragraphs 0045 and 0060).

Sehgal also teaches the composition may include accelerator to the co-solvent mixture such as sulfuric acid (paragraph 0053).

Sehgal teaches the temperature of the super critical fluid will be much higher than critical temperature of 31 degree C (paragraph 0010) and that could be 55 degree C as explained in example 1 (paragraph 0074).

Sehgal also teaches the higher temperature (about 80 degree) and pressure will accelerate the stripping of photoresist using the supercritical fluid (paragraph 0058).

Therefore, it would have been obvious to one of ordinary skilled in the art would have been motivated to do so for accelerating the stripping rate.

As to claim 37, Sehgal teaches the use of isopropyl amine in the composition including SCF (see claim 21).

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8. Claims 24,28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 and 35 above, and further in view of De Young et al (6,669,785).

As to claim 24, Sehgal discloses above in the paragraph 7 but fail to teach the etchant could comprises triethylamine trihydrofluoride.

However, De Young et al disclose a composition for removing photoresist/antireflective coating with additives such as hydrogen fluoride or triethylamine trihydrofluoride (col.2, lines 26-41 and col.4, lines 43-65).

As to claims 28-30, since the photoresist and the BARC material is removing, it would have been obvious to have residual amount of the above materials present in the removing solution.

9. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 above, and further in view of Xu et al (US 2003/0125225).

Sehgal discloses above in the paragraph 7 but fail to teach the repetitive carrying out the dynamic flow contacting and static soaking contacting the substrate to be cleaned.

However, Xu et al teach a cleaning/removal process of unwanted residue including unexposed photoresist using supercritical fluid composition as claimed including the steps of contacting the fluid to the substrate by flowing and repeated

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cycles of soaking to achieve substantially complete removal of the unwanted materials from the substrate (paragraphs 0059-0061).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Xu et al's teaching into Sehgal's process for complete removal of the residual material in order to have a cleaned surface as taught by Xu et al.

10. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 above, and further in view of Hess et al (6,627,588).

Sehgal discloses above in the paragraph 7 but fail to teach the removal process involve the removal of ion implanted photoresist.

However, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to remove the ion-implanted photoresist as Hess et al teach the conventional removal of photoresist and ion implanted photoresist using isopropanol (abstract and col.1, lines 50-61).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Hess et al's teaching into Sehgal's process for efficient cleaning of the ion implanted photoresist as well as the photoresist in order to have cleaner surface to work with in the subsequent processing.

In the above, examiner assuming the implanted ion came from the ion-implantation of the substrate prior to the removal process.

Conclusion

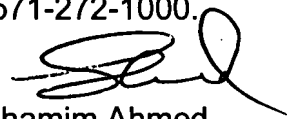
11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Peters teach a residue removal process including the use of supercritical fluid of CO₂ in the temperature range of 31-120 degree C (see paragraph 0024).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Shamim Ahmed
Primary Examiner
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SA
April 30, 2007